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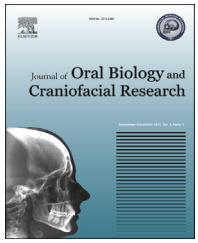

Original Article

Prevalence and knowledge of risk habits for oral cancer and their correlation among general public of Gorakhpur city, India

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ABSTRACT

Objectives: India has one of the highest incidence rates for oral cancer as recorded by global cancer statistical data. Prevention is possible through early detection and by creating awareness in the public. The present study was undertaken to determine the prevalence of oral cancer risk habits among various demographic groups and to assess the relationship of these prevalence's to the respondents' knowledge regarding respective habits as being potential risk factors.

Method: A questionnaire-based household survey was conducted in different parts of Gorakhpur city (U.P., India) on the general population. A total of 2093 persons participated in the survey.

Results: The prevalence of each of the habits was found to be significantly associated with demographically classified groups; and with the knowledge of that habit as a prospective risk factor for oral cancer; respectively. Most odd ratios evaluating the knowledge of risk habit as possible risk factor for oral cancer were greater than unity and statistically significant with regards to smokeless tobacco and alcohol use, but not for smoking.

Conclusion: Increased knowledge was shown to be a deterrent to risk habits except in cases of smoking where more individuals who smoked did so despite knowing that smoking is a risk factor compared to those who did not smoke. Prevalence of smokeless tobacco use was greater among all demographically classified groups compared to smoking or alcohol use pointing toward a rising trend. These results demonstrate a need for anti tobacco interventional and motivational programs.

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1. Introduction

Oral cancer refers to a subgroup of head and neck malignancies that develop at the lips, tongue, salivary glands, gingiva, floor of the mouth, oropharynx, buccal surfaces and other intra-oral locations, according to the International Classification of Diseases (ICD version 9, categories: 140–146, 149).[1]

The annual estimated incidence is around 275,000 for oral and 130,300 for pharyngeal cancers excluding nasopharynx with two-thirds of these cases occurring in developing countries. There is a wide geographical variation in the incidence, the areas characterized by high incidence rates for oral cancer (excluding lip) are found in the South and Southeast Asia.[2] The variation in global incidence of oral cancer is related to difference in exposure to known etiological factors such as tobacco and betel nut chewing, smoking and alcohol consumption.[3]

In India, because of cultural, ethnic, geographic factors and the popularity of specific addictive habits, the frequency of oral cancer is high. It ranks number one in terms of incidence among men and third among women.[4]

Studies show a survival rate of about 60% in developing countries when the tumor is diagnosed at an early stage in oral cancer cases and 15% in cases presenting late with distant metastasis.[5] This is paradoxical in oral cancer cases because almost two thirds of all cases occur due to lifestyle factors and are preventable.[6] Moreover, visual access to oral mucosa is so easy that early detection is theoretically simple but, despite this, the proportion of oral cancer cases diagnosed at an early and localized stage is still less than about fifty %.[7] The main cause of this paradox appears to be lack of public awareness of the signs, symptoms and risk factors associated with oral cancer.[8] One of the major components of primary prevention is health education, influencing knowledge and behavior of the society. Hence, a cross-sectional study was planned on the general population of Gorakhpur city in order to not only determine the prevalence of oral cancer risk habits; smoking, smokeless tobacco (ST) and alcohol use but also its relationship to the knowledge pertaining to the respective habits. General awareness of oral cancer, its symptoms and risk factors was studied as part I of this study.[9]

2. Method

In the year 2012, a questionnaire-based survey was performed on the general population focusing more on young adults in Gorakhpur city, one of the high-risk semi urban areas of eastern U.P. (India) where the use of tobacco and alcohol is very popular.

2.1. Sample

The district Gorakhpur was divided into twenty zones and 100 households were randomly selected from each zone and a single subject above 10 years of age was interviewed from each household. Individuals diagnosed with oral cancer at any point of their lifetime were excluded from the study.

2.2. Procedure

The questionnaire and the study procedures were approved by the institutional review board and its ethical committee. A pilot study was conducted to discern the sample size and also for assessment of the validity, reliability and acceptability of the questionnaire.

2.3. Measuring tool

The questionnaire consisted of three parts. Part I comprised 16 closed-ended questions that assessed the subjects' awareness of oral cancer, knowledge of signs/symptoms and risk factors for oral cancer which was analyzed in an earlier study.[9] Part II assessed the prevalence of personal risk habits. The questionnaire was based on Global Adult Tobacco Survey (GATS) for smoking and ST use with exclusion of few questions. Similarly prevalence of alcohol use was also assessed. Socio-demographic information was recorded and responses were scored in accordance with defined rules.

2.4. Statistical analyses

The demographic details and the scores were recorded and statistical analysis was performed using SPSS version 15. χ^2 tests assessed the significance of the differences in the prevalence's of various habits across the demographic groups as classified based on gender, age and level of education. It also assessed the relationship of the prevalence of individual habits to the knowledge pertaining to the respective habits being a potential risk factor for oral cancer. This was elaborated in terms of odds ratios (OR). As calculated for each habit under investigation, it was defined as the ratio of odds of the habit in respondents not aware of that respective habit being a risk factor to that in those who are aware, in each demographic group. Significance was established at $P < 0.05$.

3. Results

3.1. Prevalence of habits

Figs. 1–3 depict the prevalence of smoking, ST and alcohol consumption respectively; across various demographic groups. The prevalence of each of these habits was significantly associated with gender, age-group and level of education ($P = 0.000$). Fewer females were habitués than males for each of these habits. The prevalence of smoking and chewing was directly proportional to the age groups studied. Even though this trend was not confirmed for alcoholism, the youngest studied age group (<20) reported the minimum prevalence (5.3%) of this habit as opposed to the eldest age group studied (>50) that reported the maximum prevalence (22.3%) of this habit. Among the different education groups, each of the habits assessed were more prevalent in respondents with primary level education. While smoking and alcohol use was least prevalent in the group with high school education, use of ST was least reported amongst graduates.

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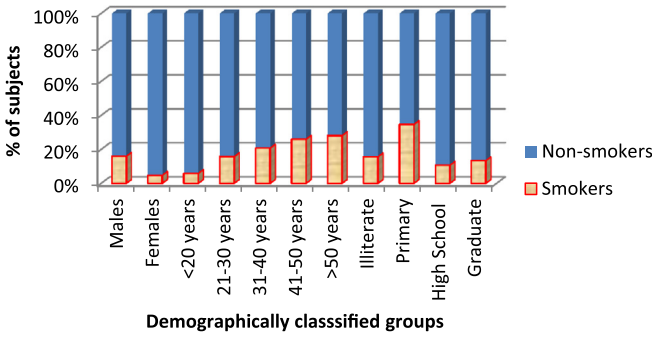

Fig. 1 – Prevalence of smoking across various demographically classified groups.

3.2. *Relationship of habits prevalence with knowledge of habits as risk factors*

χ^2 tests (Table 1) were done to relate the ever/non-users of smoking, ST, alcohol with the knowledge of the respective habit being a risk factor for oral cancer. Only 83.3% of the ST users in contrast to 90.4% of the non-users were aware that ST could cause oral cancer. A similar trend was observed for alcohol too, but the results were statistically insignificant. On the other hand and strikingly, in contrast to 74.4% of the non-smokers, 81.6% of the smokers correctly identified smoking as a risk factor.

The evaluation of knowledge of various habits as possible risk factor for the presence or absence of the habit was carried out. Results showed among males, the risk of using ST in respondents not aware of ST as a risk factor was 1.96 times more than the risk of ST use in those who were aware (OR, 95% confidence interval). Similarly the relative risk was 2.35 for high school educated among the various educational groups and 2.73 & 2.48 for the <20 and 21–30-year age groups. These significant OR point toward an increased vulnerability of the specific group for becoming a habitué in absence of knowledge.

The relative risk of misuse of alcohol was significant for males (OR = 4.82), for graduates (1.69) among the educational groups and a risk of 219.38, 6.95 was observed for the 21–30 and >50-year age groups.

For smoking the odds ratio though statistically significant in most of the groups, was below unity (Table 2).

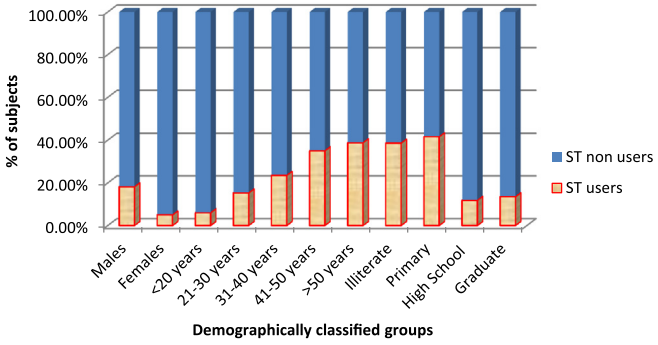

Fig. 2 – Prevalence of smokeless tobacco (ST) use across various demographically classified groups.

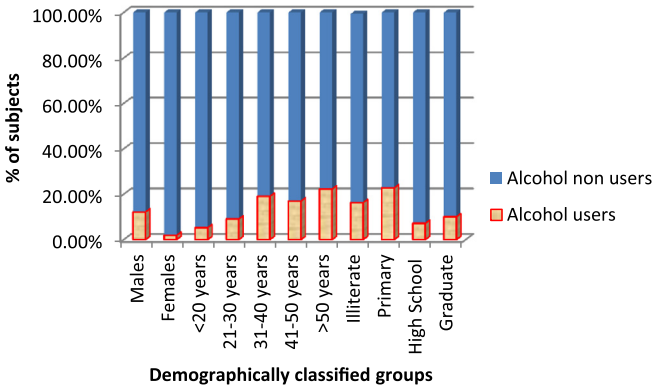

Fig. 3 – Prevalence of alcohol use across various demographically classified groups.

4. Discussion

The health consequences of smoking, consumption of ST and synergetic effect of tobacco and alcohol have been well documented as being significant contributors to excess mortality.[2]

Up to 75% of oral cavity cancers, are thought to be attributable to the separate and multiplicative synergetic effect of alcohol and tobacco use, which could be prevented by the elimination of tobacco use and a reduction in alcohol consumption. Hence, it was considered worthwhile to determine the prevalence of oral cancer risk habits and its relationship to the knowledge of respondents pertaining to the respective habits as potential risk factors for oral cancer.

4.1. *Prevalence of habits*

The present study shows that the consumption of ST is more prevalent (15.19%), when compared to smoking (13.4%) and alcohol consumption (9.6%) in the Indian subpopulation studied. Other studies report a generally higher prevalence of smoking over ST consumption in the western regions of globe and more use of ST in regions of Southern Asia.[4,10,11] Such wide variation in the global prevalence of habits is seen mainly due to difference in cultural, ethnic, regional preferences and geographic factors.

A significant gender difference was seen for tobacco use and alcohol consumption. Fewer females were habitués of risk factors compared to males in our study. Similar prevalence is seen almost globally, the reported sex differences are attributable to heavier indulgence in risk habits by men and exposure to sunlight (for lip cancer) as a part of outdoor occupations.[2] An increase of oral cancer in females in Indian subcontinent is lately being seen due to changing social habits with more smoking and alcohol consumption in urban areas and more ST use in rural areas.[12] Mehrotra et al[13,14] developed a reliable questionnaire to quantify habit of substance abuse with development of oral submucous fibrosis and observed that 13.25% males and 15.46% females suffered from oral submucous fibrosis due to tobacco and non tobacco areca nut consumption.

Our results show that the prevalence of smoking and ST consumption was directly proportional to age; the above 50-

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Table 1 – Distribution of subjects with and without each habit according to knowledge of the respective habit.

Knowledge	Smoker	Non-smoker	ST users	ST non-users	Alcohol users	Alcohol non-users
Yes	230(81.6%)	1348(74.4%)	265(83.3%)	1604(90.4%)	58(28.2%)	646(34.2%)
No	26(9.2%)	251(13.9%)	22(6.9%)	71(4.0%)	104(50.5%)	821(43.5%)
Don't know	26(9.2%)	212(11.7%)	31(9.7%)	100(5.6%)	44(21.4%)	420(22.3%)
X^2/P value	6.94/0.031**		13.96/0.001*		4.15/0.13	

$P < 0.05$ is considered statistically significant, **denotes $P < 0.05$, *P = 0.001.

year age group was most likely to be a habitual. Though not directly proportional, alcohol consumption was also found to be more in older age groups. Other extensive studies show evidence that the prevalence in younger generations is on the rise and tobacco use, in whatever form, generally begins during adolescence.[10] The difference in results might be due to false reporting of personal use by habitués especially among the younger age groups.

Lesser prevalence of all risk habits in respondents with high school and graduate level of education were seen compared to illiterates and those with only primary education. Similar results by Murti et al, 1994 show an inverse relationship between the levels of education and the use of tobacco.[15] Indicating, a higher level of education results in better knowledge of risk factors of oral cancer as was also discussed in our previous study.[9]

4.2. *Relationship of habits prevalence with knowledge of habits as risk factors*

Knowledge regarding risk habits of individuals was assessed and subsequently correlated to the prevalence of habits. The percentage of habitués and non-habitués who could correctly identify the respective habit as a risk factor for oral cancer was determined. Misconception about risk factors reduces the chance of making intelligent decisions regarding personal habits so proper knowledge is expected to be a deterrent to use of deleterious products, which may lead to oral cancer. But, to our surprise, more individuals who smoked did so despite knowing that smoking is a risk factor compared to those who did not smoke. This shows that correct knowledge regarding smoking rather failed to act as a deterrent for smoking. This may be explained by the fact that acquisition of tobacco habits may start at a very young age resulting in addiction with strong nicotine dependence even before learning about the potential harmful effects. It is also likely that despite knowledge the required awareness is not present and smokers underestimate the magnitude of their personal risk.

However, fewer habitués of ST and alcohol knew about the risk factors compared to non-habitués indicating that lack of knowledge pertaining to the associated risk of oral cancer may be the reason for more consumption. 50% of the individuals who consumed alcohol did not know about it being a risk factor.

To identify and target awareness programs toward particular demographic groups the relative risk was evaluated. The above unity OR indicates the risk of being a habitué is more in respondents not aware of that habit being a risk factor for oral cancer compared to those who are aware. Results (odds ratio) for ST users indicate substantial risk for males, for respondents with high school level education, respondents falling in the <20 and 21–30-year age group. Whereas for alcohol the risk was more for males, among the educational groups for the primary level and graduates and among almost all age groups. This indicates a need for targeting the population at an early stage so as to include the younger generation and specially the males (Table 2).

Anti tobacco education can be imparted through schools, hospitals, government health programs and via commercial print and visual media. This will result toward negative attitudes for tobacco and greater cessation-oriented intentions.

Table 2 – Evaluation of knowledge of each habit as a risk factor for the respective habit across various demographic groups using odds ratios.

Demographic classification		Smoking		Smokeless tobacco		Alcohol	
		Odds ratio (95% CI)[a]	P value	Odds ratio (95% CI)[a]	P value	Odds ratio (95% CI)[a]	P value
Gender	Male	0.65(0.46–0.91)	0.01*	1.96(1.37–2.81)	0.00*	4.82(3.47–6.70)	<0.00*
	Female	1.10(0.44–2.73)	0.84	1.66(0.54–5.05)	0.3	1.81(0.37–8.80)	0.46
Level of education	Illiterate	0.19(0.05–0.75)	0.02*	1.48(0.55–3.97)	0.44	0.55(0.13–2.36)	0.42
	Primary	0.20(0.07–0.58)	0.00*	0.59(0.22–1.60)	0.30	0.40(0.15–1.05)	0.06*
	High School	0.56(0.30–1.03)	0.06*	2.35(1.32–4.16)	0.00*	1.32(0.74–2.34)	0.35
	Graduate	0.90(0.59–1.38)	0.64	1.51(0.87–2.59)	0.14	1.69(1.07–2.67)	0.03*
Age	<20	1.22(0.65–2.28)	0.53	2.73(1.39–5.37)	0.00*	1.48(0.80–2.74)	0.21
	21–30	0.78(0.45–1.34)	0.37	2.48(1.30–4.73)	0.01*	219.38(48.45–993.26)	<0.00*
	31—40	0.42(0.16–1.07)	0.07*	1.32(0.50–3.40)	0.57	1.01(0.47–2.15)	0.98
	41–50	0.35(0.16–0.75)	0.01*	1.42(0.53–3.78)	0.48	0.47(0.213–1.05)	0.07*
	>50	0.11(0.03–0.37)	0.00*	1.02(0.44–2.39)	0.96	6.95(1.57–30.80)	0.01*

*P < 0.05, statistically significant.
a CI = confidence interval.

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The limitation of this study is that the data completely relies on self reporting, and some if not many respondents are hesitant to acknowledge tobacco and alcohol use, so the actual habitués might be higher than reported.

In conclusion this study confirms that increased knowledge is a deterrent to risk habits except for ever smokers. Males, the younger generation and the lesser educated population should be more aggressively targeted for education regarding the ill effects of tobacco and alcohol, to create awareness before the acquisition of any such habit. Also further research is necessary to analyze the reasons for continued practice of risk habit specially smoking, despite knowledge regarding its potential for causing cancer.

Conflicts of interest

All authors have none to declare.

REFERENCES

1. World Health Organisation. *Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death*. Ninth Revision. Geneva: WHO; 1977.
2. Warnakulasuriya S. Global epidemiology of oral and oropharyngeal cancer. *Oral Oncol*. 2009;45(4–5):309–316.
3. Blot WJ, McLaughlin JK, Winn DM, et al. Smoking and drinking in relation to oral and pharyngeal cancer. *Cancer Res*. 1988;48:3282–3287.
4. Byakodi R, Byakodi S, Hiremath S, et al. Oral cancer in India: an epidemiologic and clinical review. *J Community Health*. 2012;37:316–319.
5. Sankaranarayanan R, Black RJ, Parkin DM. *Cancer Survival in Developing Countries*. IARC Scientific Publication No. 145. Lyon: International Agency for Research on Cancer; 1998.
6. Ezzati M, Lopez AD, Rodgers A, Murray CJL. *Comparative Quantification of Health Risks. Global and Regional Burden of Disease Attributable to Selected Major Risk Factors*. vol. I. Geneva: WHO; 2004.
7. Patton LL. The effectiveness of community-based visual screening and utility of adjunctive diagnostic aids in the early detection of oral cancer. *Oral Oncol*. 2003;39:708–723.
8. Warnakulasuriya KA, Harris CK, Scarrott DM, et al. An alarming lack of public awareness towards oral cancer. *Br Dent J*. 1991;187(6):319–322.
9. Agrawal M, Pandey S, Jain S, Maitin S. Oral cancer awareness of the general public in Gorakhpur city, India. *Asian Pac J Cancer Prev*. 2012;13(10):5195–5199.
10. Gupta PC, Ray CS. Smokeless tobacco and health in India and South Asia. *Respirology*. 2003;8:419–443.
11. Gilpin EA, Pierce JP. Concurrent use of tobacco products by California adolescents. *Prev Med*. 2003;36(5):575–584.
12. Rao RS, Desai PB. *Oral Cancer*. Bombay Tata Press Limited; 1991:1–5.
13. Mehrotra D, Kumar S, Agarwal GG, Asthana A, Kumar S. Odds ratio of risk factors for oral submucous fibrosis in a case control model. *Br J Oral Maxillofac Surg*; 2013 [in press].
14. Mehrotra D, Agarwal GG, Kumar S, Shukla A, Asthana A. Development and validation of a questionnaire to evaluate association of tobacco abuse with oral submucous fibrosis. *Asia Pac J Public Health*; 2011. http://dx.doi.org/10.1177/1010539511426471.
15. Murti PR, Bhonsle RB, Gupta PC. Tobacco control activities in Kerala, India. *Tob Control*. 1994;1:37. SAARC Edition.

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